Customer Relationship Management Scale for Video Games' Players: Exploratory and Ordinal Factor Analysis

Escala de Gestão do Relacionamento com Jogadores de Video Games: análise fatorial exploratória e ordinal

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ABSTRACT

Customer Relationship Management (CRM) turns out to be a relevant source of competitive advantage in a highly competitive scenario, as in the video game's industry. Thereby, the main objective of this study is to develop and validate a scale to assess players' perceptions regarding aspects they consider relevant in their relationship with Nintendo Wii games, the world's market leader in the video game's industry. We conducted a qualitative and quantitative study with 493 subjects using both exploratory and ordinal factor analysis to compare the results. We've also assessed the influence of some demographics (age, gender, and frequency of playing) on players' perceptions concerning their relationship with video games, specifically Nintendo Wii games. The results of both factor analyzes were pretty similar and the scale showed good psychometric parameters. This research is a starting point to provide a comprehensive valid measure of CRM based on customers' perspectives regarding video games. As practical implications, the CRM scale for video games may be

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used as an important diagnostic tool for Nintendo as well as for companies that develop electronic games in general. Moreover, it contributes to the deepening of studies on CRM measures for the business-to-consumer (B2C) market, still scarce on the marketing literature.
Keywords: customer relationship management (CRM); video games; scale validation; exploratory factor analysis (EFA); ordinal factor analysis (OFA).

Resumo

O Marketing de Relacionamento mostra-se uma relevante fonte de vantagem competitiva num cenário de alta competitividade, como na indústria de jogos digitais. Portanto, o objetivo deste estudo é desenvolver e validar uma escala para avaliar a percepção de jogadores acerca de aspectos que eles consideram relevantes em seu relacionamento com os jogos do Nintendo Wii, líder do mercado mundial. Foi conduzido um estudo qualitativo e quantitativo com 492 sujeitos utilizando tanto a análise fatorial exploratória, quanto a análise fatorial ordinal para a comparação dos resultados. Também foi verificada a influência de dados demográficos (idade, gênero e frequência de jogo) na percepção dos jogadores no seu relacionamento com os jogos, especialmente os do Nintendo Wii. O resultado das análises foram similares e a escala apresentou bons valores psicométricos. Esta pesquisa é um ponto de partida para fornecer uma medida válida abrangente de CRM baseada na perspectiva dos clientes de jogos digitais. Como implicação prática, a escala de CRM para jogos digitais pode ser utilizada como uma importante ferramenta de diagnóstico para Nintendo bem como para empresas que desenvolvem jogos eletrônicos. Além disso, contribui para o aprofundamento do estudo da mensuração do CRM em mercados consumidores (B2C), escassa na literatura de marketing.
Palavras-chave: marketing de relacionamento; jogos digitais; validação de escala; análise fatorial exploratória (AFE); análise fatorial ordinal (AFO).

Introduction

The high competitiveness is present in several industries, making migrating customers something routine. In addition, at-

tracting new customers can be significantly more expensive than keeping them (DEMO; PONTE, 2008). In such context, companies should invest more in getting customers' loyalty. Therefore, CRM (Customer Relationship Management) took a broader sense than just be a database of customers. Payne (2006) argues that CRM is a strategic activity that seeks to create value for shareholders by building relationships with strategic customers, combining the power of information technology (IT) and marketing strategies.

Large companies that develop video games are known to have many loyal customers truly passionate about their products and brands, which are crucial in a highly competitive industry, where there are thousands of releases each year, and the life cycle of products is short. In this sense, the research questions of this paper is: how video games' companies can better understand how to meet client's needs in order to deliver high-value products and get their loyalty through a long-term and profitable relationship?

Therefore, the main objective of this study is to develop and validate a scale to assess players' perceptions regarding aspects they consider relevant in their relationship with video games, also known as electronic games, specifically Nintendo Wii games, the world's market leader in the video game's industry. Furthermore, we've also assessed the influence of some demographics (age, gender, and frequency of playing) on such players' perceptions. The CRM scale developed and validated by Rozzet and Demo (2010) in Brazil was the basis for this study because it was the only scale found on the literature focused on the business to consumer (B2C) market.

Jöreskog and Moustaki (2001) claim that a wrong practice is perpetuated in validation of instruments: the use of proper methods of continuous variables on scales of ordinal variables, as often occurs in the validation of instruments for fields such as Management and Psychology. An example is the use of exploratory factor analysis (EFA) for instruments using Likert scales. The authors state that numbers should be treated as categories, once they don't show metric properties. However, for large samples (e.g., over 300), it seems possible to use EFA for Likert scales, obtaining similar results as using OFA (Holgado–Tello, Chacón–Moscoso, Barbero–García, & Vila–Abad, 2010). Thus, another objective of this study is to verify

DOI: http://dx.doi.org/10.15603/1982-8756/roc.v11n22p285-312

if the results obtained trough EFA differs significantly or not from those obtained trough Ordinal Factor Analysis (AFO), supposed to be the more suitable method for Likert scales' validation.

In the following section, we present the literature review of CRM. Then, the methods are described, concerning the qualitative and quantitative analyzes to develop and validate a scale. Finally, the results are presented and discussed, and concluding remarks are made, focusing on the contributions of the study and recommendations for future research.

Theoretical Background

It is important to consider the competitiveness perspective on organizational studies. Along with globalization and new technologies, competitiveness is imperative and characterized by the non-stop organizational search for competitive advantage. For Mishra and Mishra (2009), Customer Relationship Management (CRM) can help organizations manage their interactions with customers more effectively in order to maintain competitiveness.

According to Porter (1991), competitive advantage is the result of the organizational capacity on efficiently accomplishing a set of activities required to obtain a lower cost compared to competition or organizing such activities in a unique way that creates value to customers. Kumar, Jones, Venkatesan and Leone (2011) investigated if market orientation is, indeed, a source of sustainable competitive advantage and discovered a positive effect of market orientation when crossed with business performance on either long or short terms. The relationships between organizations and their clients develop special meanings in order to obtain high levels of prosperity and CRM, comprising aspects of satisfaction, customer loyalty and, mainly, the non-stop offer of unique and enchanting experiences to customers, present itself as a profitable differential when talking about competitiveness.

For Grönroos (1994), Sheth and Parvatiyar (2002), and Payne (2006), relationship marketing represents a paradigm shift on marketing concepts, a change on marketing orientation from just attracting customers to having customer's retention and loyalty. For Payne (2006), CRM provides opportunities to use information,

know clients better, offer value by customized sales and develop long-term relationships. The company should have know-how on processes, operations and integration in order to allow that the core of marketing become the philosophy that guides the business. This vision confirms the holistic idea of relationship marketing, where there is interaction among all parts of the organization.

Vavra (1993) also considers the attraction of customers as the beginning of the relationship. The constant aftermarketing interaction represents an extremely important stage that allows the relationship to be settled, being as important as the sale itself. He defends that customer retention is far more important than customer attraction and that there may be a shift from just selling to beginning a relationship. These shifts reflect the transition from the transactional marketing to the relationship one. The author also presents a strategic relationship marketing approach placing the customer in first and changing the marketing role of manipulating customers to making a real commitment with them. The author emphasizes the retention of profitable customers, multiple markets and an approach regarding multifunctional marketing, in which the responsibility for marketing strategies development and relationship with the customer is not limited to the marketing department only.

According to Reichheld and Sasser (1990: 105), as the relationship between the organization and the customer extends the profits grow. They affirm "companies can boost profits by almost 100% by retaining just 5% more of their customers". The authors further contend that, if served correctly "customers generate increasingly more profits each year they stay with a company" (REICHHELD; SASSER, 1990, p.106). Due to the large increase in competition and the constant technological improvement, customers have a much larger range of choices in comparison to what they previously had.

In this sense, Payne (2006) states that the distinguishing factor, then, becomes the delivery of an exceptional, distinct and consistent service. Competitive advantage can be acquired by knowing the expectations, preferences, and behavior of customers. Thus, retaining customers, developing a relationship and continuously satisfying them can be considered the basis for a successful trajectory for most organizations. "Long-term customers buy more, take less

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of a company's time, are less sensitive to price and bring in new customers. Best of all, they have no acquisition or start-up cost" (REICHHELD, 1996, p.2). According to Demo and Ponte (2008), it costs around 10 times more to attract customers than to retain them.

Although CRM has become an extremely relevant proposal, the comprehension of what it means is still limited. Many companies do not understand CRM as a marketing synonym and see it as a technological solution. They make a conceptual mistake by equaling customer relationship marketing to support systems for CRM implementation.

For Payne (2006), CRM is a strategic holistic approach to manage the relationship with customers in order to create value to the stockholder. He states that although CRM provides more opportunities to understanding the customer through data and info utilization and to implementing the relationship marketing strategies in a better way, it is not limited to an information system or a technologic tool. The author stresses that the importance of defining CRM correctly is not a semantic preciousness. Such definition significantly impacts the way CRM is understood, implemented and practiced in organizations.

Regarding this controversy, Bygstad (2003) conducted a longitudinal 6-year case study of a company implementing CRM both as a marketing principle and as an information system. He concluded that the high failure rate of CRM projects illustrates the gap between intentions and outcomes. The author found two alternatives to improve CRM practice: 1) There is a struggle of organizational interventions and CRM projects should be treated as a complex challenge – not necessarily successful – that needs tight control and application of change management techniques; 2) There is a technological drift and the system will be used in more ways than intended.

So Bygstad (2003) attests that mechanisms at the micro level are actually only partly controllable by management techniques and the infrastructure should grow organically making it impossible to predict the outcome. Considering that CRM is linked to the Business Process Reengineering (BPR) thinking, these two alternatives are a paradox that should be studied and looked into more carefully, according to the author.

Payne (2006) highlights that CRM needs to be infused with strategic vision to create value to the stockholder through the development of relationships with strategic customers, bringing together the potential of information technology (IT) to the relationship marketing strategies that will result in the establishment of profitable long-term relationships.

Mishra and Mishra (2009) also agree that CRM is an integration of IT and relationship marketing. Their study presents a successful implementation of CRM from a process perspective in a transnational organization that operates in different segments and contributes to the understanding of the transition, constraints and implementation process of CRM in such organizations. The results show that as more and more organizations realize the significance of becoming customer-centric in today's competitive era, they adopted CRM as a core business strategy and invested heavily.

Huang and Xiong (2010) notice that CRM has reached a strategic maturity and it influences the entire cycle of life of a product and not only the before or after-sales stages. Still on the enlargement of CRM influence, Ernst, Hoyer, Krafft and Krieger (2011) sustain that its potential has been only investigated on already existent products cases, but it should be considered on the development of new products as well, once their studies showed that CRM has a positive correlation with performance and success of new products.

Also considering that corporative culture has not been sufficiently studied on relationship marketing, Iglesias, Sauquet and Montaña (2011) presented a model of corporative culture from a CRM-oriented organization. The results showed two primary factors needed for its effectiveness: "client orientation" and "high level of care for employees". Moreover, other six- shared values (confidence, involvement, teamwork, innovation, flexibility and results orientation) also would facilitate the orientation development towards relationship marketing.

As for literature reviews regarding CRM, Ngai's (2005) first article was considered a milestone regarding the academic literature about customer relationship marketing. It analyzed 205 articles in different databases published in over 85 different academic reviews from 1992 to 2002. Ngai's (2005) study concluded for the force of

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CRM research, questioning about the low percentage of theoretical reviews related to CRM privacy, and predicting that the field would continue to present significant growth during the next years.

The most recent reviews were from Ngai, Xiu and Chayu (2009) and Wahlberg et al (2009). Ngai, Xiu and Chayu (2009) wrote the first academic review on the application of data mining techniques for CRM. The article provides an academic database of the literature from 2000 to 2006 that comprehends 24 scientific journals and proposes a classificatory scheme that comprises 900 articles, which were identified and analyzed regarding the direct relevance for the application of data mining techniques for CRM.

The categorization done by Ngai, Xiu and Chayu (2009) took into account 4 CRM dimensions (customer identification, customer attraction, customer retention and customer development) as well as 7 data mining functions (association, classification, cluster, prediction, regression, discovery of sequential patterns and visualization). The results showed that customer retention is the most researched area of all and the one-to-one marketing and loyalty programs are the most investigated themes. On the other hand, models of classification and association are the most commonly used in data mining regarding CRM.

Wahlberg et al (2009) contributed to the CRM research knowledge by questioning the evolution of CRM research through time and identifying trends and research topics from 4 investigation areas: strategic CRM, analytical CRM, operational CRM and collaborative CRM. 468 articles were selected and the results showed that the number of articles about CRM as a specific topic was relatively low until the end of the nineties, exactly as pointed by Ngai (2005), which confirms the aspect of novelty CRM holds on marketing research.

According to, Wahlberg et al (2009), the results showed maturity in the CRM scientific research field, dominated by CRM subfields of strategic and analytic CRM, including a change from analytic to strategic CRM, which was the most popular by the end of the studied period of time. Another conclusion withdrawn from the study was the predominance of the research on big companies at the expense of medium and small businesses whose characteristic must be taken into account.

Concerning CRM measures, we found some studies with scale validation that were mostly based in 5 measurement scales. First, Wilson and Vlosky (1997) developed a CRM scale for the business--to-business (B2B) market. Sin, Tse and Yim (2005) validated a scale to measure the CRM dimensions practiced by the companies in the financial service sector of Hong Kong. Harmeen and Sandhu (2008) developed a scale for CRM applied to manufacturing industries in India. More recently, Öztaysi¸ Sezgin and Özok (2011) proposed an instrument for the measurement of CRM processes in Turkey that addresses seven different processes.

Rozzett and Demo (2010) developed a scale with good psychometric indexes specifically for the B2C market to assess customer's perception of relationship. This scale was the only one found on the literature addressed to the B2C market. That's why the present study is based on Rozzet and Demo's work.

Methods

Qualitative Study

The qualitative study was focused on the development of the scale. For this purpose, we interviewed 40 Brazilian players of various ages and both genders. The number of participants was based on the thresholds proposed by Bardin (2011). The author asserts that there is evidence of sample's adequacy when the answers start to repeat themselves. Besides, in descriptive researches, the group of participants should be diverse and representative. Participants answered two questions, adapted to the understanding of children, who also were the target of the research: what should a game have for you to enjoy it? What should a game have for you to want play it more or to buy similar games? Those two questions were intended to identify the most important elements of a game that lead to satisfaction and loyalty of players, components of a long-term relationship (Levitt, 1990; Reichheld & Sasser, 1990; Vavra, 1993, Bolton, 1998; Rozzet & Demo, 2010).

The content of the interviews were audio recorded, transcribed and categorized, formulated according to the theory about electronic/video games (SCHELL, 2011; NOVAK, 2010). The frequency

DOI: http://dx.doi.org/10.15603/1982-8756/roc.v11n22p285-312

with which the elements were cited also was recorded because the frequency of appearance of an element reveals its importance. Thus, we used the categorical thematic content analysis proposed by Bardin (2011).

Besides the interviews, the CRM scale for video games was elaborated from the literature about games and the adaptation of the CRM scale's items developed by Rozett and Demo (2010) as well.

Initially, the scale comprised 39 items: 16 assessing loyalty and 23 assessing satisfaction. All items were measured using a 5-point Likert scale. The scale also comprised 3 items of demographics (age, gender and frequency of playing).

Following the recommendations of Pasquali (2012) and Kerlinger and Lee (2008), the scale went through semantic analysis, where 27 students of Management verified if the items were ambiguous or easy to understand by making sense within the context proposed. Simultaneously, the judges' analysis was performed, where it was examined whether the proposed items referred to the construct of CRM indeed in the specific case of the players of video games. In total, there were 7 judges: two professors of Management, two of the Eletronic Games field, two of a Elementary School and a professional of Computer Science. The Elementary School teachers suggested adaptations of the scale's language to make it understandable to children.

Quantitative Study

The quantitative study was focused on the validation of the scale. For this purpose, 549 subjects answered the instrument. After data screening, 493 subjects composed the final sample, enough according to Tabachnick and Fidell's criterion (2007), that is a sample of less than 300 subjects is normally inadequate to run a factorial analysis.

The sample was restricted to subjects who had already played video games, and it was also initially limited by Internet access, because the survey scale was applied online in Brazil. The scale was distributed through specialized online forums on games, lists of email, social networks and communities specializing in video games. However, in order to get a greater variety of respondents, the survey was also conducted in stores specializing in video games and computers, Elementary Schools, Middle Schools and Colleges located in Brasilia, Brazil. The sample was composed primarily of

men (66%). Of the subjects, 31% of respondents were between 10 and 18 years old, 45% between 19 and 24 years old, 21% between 25 and 34 years old, and 3% were 35 years old or over. Regarding the frequency of playing, 26% of the subjects claimed they play more than 1 hour per day, 36% used to play less than 1 hour per day, and 38% said they rarely play.

Data were examined and the assumptions for multivariate analysis were checked, following the procedures recommended by Myers (1990), Menard (2002), Tabachnick and Fidell (2007) and Hair et al (2009). Data was found to be very precise, with no registration errors or discrepancies in average and standard deviation measures. Also, there wasn't any case of multicollinearity or singularity as tolerance values were above 0.2 (Menard, 2002) and variance inflation factor (VIF) values were less than 5.0 (Myers, 1990). Analyses of outliers, normality and linearity were conducted as well and 56 individuals from the original sample (549) were deleted by using the Mahalanobis distance criterion ($D2 = 67.98$; $p<0.001$). The percentage of missing data was lower than 5%, which were excluded by the Listwise Deletion method (TABACHNICK; FIDELL, 2007; HAIR et al., 2009). The software used was the Statistical Package for Social Sciences (SPSS) version 19.

In order to validate the scale, we performed the Exploratory Factor Analysis defined by Kerlinger and Lee (2008) as a fundamental psychometric technique regarding the validation of research instruments/scales. Theoretical consistency of the scale items was verified and its validity was evaluated by the items' loading factors. The scales's reliability was assessed by the Cronbach's alpha index.

The Ordinal Factor Analysis was performed to attest if the exploratory factor analysis should have been used for the CRM scale for video games, an ordinal scale (Likert scales). The software used was the Statistical Analysis System (SAS), version 9.2. We ran the polychoric correlation, a technique to estimate the correlation between variables that are theoretically continuous but were measured by means of ordinal variables, as Likert scales (RIGDON; FERGUSON, 1991). Polychoric correlation needs parameters with theoretical basis. Thus, we used the values of the factor loadings obtained trough EFA as the required parameters. The comparison between the techniques, EFA and OFA, was performed using the

DOI: http://dx.doi.org/10.15603/1982-8756/roc.v11n22p285-312

mean and the standard deviation from the subtraction of the factor loadings (OFA minus EFA).

Finally, descriptive statistical information were analyzed (means and standard deviation) to identify how the players surveyed evaluate their relationship with video games, specifically Nintendo Wii. Analysis of Variance (ANOVA) was used to verify if the age, gender and frequency of playing of the players influence indeed their evaluation regarding the relationship with video games.

Results And Discussion

Qualitative analysis

The CRM scale for video games was drawn from the tabulation of the responses from the interviews, the categorization of content and the frequency analysis of the responses, as defined by Bardin (2011). Regarding the satisfaction construct, 17 items were created from interviews. The frequency of those categories is showed on Table 1.

Table 1 - Category Frequency (Satisfaction)

Category	Frequency	%	Originated Item
Gameplay	17	42.5	Q26
Graphics	15	37.5	Q21
Multiplayer mode	13	32.5	Q27
Story	12	30	Q23
Genre	9	22.5	Q19
Innovation or originality	8	20	Q20
Characters	8	20	Q25
Unpredictability	7	17.5	Q34
Sound and music	6	15	Q22
Level design	6	15	Q24
Game goals	5	12.5	Q31
Character customization	5	12.5	Q28
Difficulty	5	12.5	Q30
Loading time	4	10	Q35
Game rewards	4	10	Q32
Languages available	3	7.5	Q36
Game rules	3	7.5	Q33

Table 2 shows the frequency of categories and origin of the items regarding the loyalty construct. In total, three items were originated.

Table 2 - Category Frequency (Loyalty)

Category	Frequency	%	Originated Item
Fun	12	30	Q8
Interaction with others players (competition, cooperative)	7	17.5	Q5
Replay value or "replayability"	5	12.5	Q10

Video games are extremely complex and use several elements, which complicates its identification by the player. Therefore, we chose to consider low-frequency items, but it is understood that the items most frequently are the most relevant.

After the elaboration of the items from the categories, we performed both semantic and judges' analyzes to check the consistency of the instrument. The items that showed either lack of clarity or ambiguity were modified or eliminated. Thus, the application version of the scale comprised 36 items and 3 demographics.

Quantitative Analysis

First, we performed the exploratory factor analysis. According to Field (2009), factor analysis aims to verify if the measured variables correlate and are part of a larger dimension, called factor. We assessed whether the sample's variables presente or not factorability, measured for example by the index Kayser-Meyer-Olkin (KMO). The value obtained was 0.943. According to Kaiser (1974), values above 0.9 are considered wonderful indicating that the sample is factorable.

Thus, the Principal Component Analysis (PCA) was performed to obtain the number of dimensions or factors. We set a minimum factor loading of 0.32 as recommended by Pasquali (2012). The method of oblique rotation was selected, in which the factors can be correlated, as is common in behavioral sciences. The procedure adopted was Promax Rotation and for extracting factors we considered Guttman-Kaiser test, scree test, total variance explained, and

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parallel analysis, which involves comparing estimated eigenvalues obtained trough the RanEigen software to the empirical ones. Finally, the correlation matrix of factors was inspected for the presence of second-order factors by looking for significant correlation between factors, but the results indicated a one-factor solution.

After, scale's items were analyzed for validity by verifying its factor loadings, in other words the correlation of items with the factor. Comrey (1973) states that the items of a scale can be classified as: excellent (greater than 0.71), very good (greater than 0.63), good (greater than 0.55), reasonable (greater than 0.45), poor (greater than 0.32) and negligible (less than 0.30).

Tabachnick and Fidell (2007) state that items with factor loadings less than 0.45 can be eliminated. Such criterion, combined with the search for higher total explained variance, the reliability of the scale and, especially, the theoretical adequacy of the items to the literature reviewed, were used for the selection of the items to compose the final version of the CRM scale for video games. The final version of the scale comprised 24 items of high quality, distributed as follows: 1 excellent item, 13 very good items and 10 good items, confirming the validity of the scale, according to Comrey's criteria and also explaining about 44% of total variance of the construct.

Next, we ran the ordinal factor analysis adopting the same criteria we did in the exploratory factor analysis to select items. The results present the addition of two items to the scale comparing to the EFA analysis. However, in order to better compare the results from the two analyzes, we decided to maintain the 24 items obtained through EFA. The scale validated through OFA was found to outperform the one validated through EFA regarding validity once it showed 10 excellent items, 11 very good items 11 and 3 good items. Nevertheless, those variations can be considered small since the loads varied positively by an average of 0.048 with a standard deviation of 0.023 only. Moreover, the total variance explained suffered significant reduction in the AFO analysis, that is 12% comparing to 44% obtained through EFA. Cronbach's alphas for reliability remained unchanged for both analyzes. EFA and OFA analyzes are shown on Table 3.

Table 3 - Factor Loadings of CRM Scale for Video Games

Item	Loading	Quality
Q24. Level design.	.767	Excellent
Q22. Sound and music.	.699	Very Good
Q25. Characters (charismatic, well constructed, unforgettable).	.697	Very Good
Q23. Story.	.697	Very Good
Q20. Innovation or originality.	.692	Very Good
Q29. Graphical User Interface (menu, life bar, minimap).	.688	Very Good
Q17. Overall quality.	.679	Very Good
Q30. Challenge/difficulty.	.667	Very Good
Q26. Gameplay/interactivity.	.664	Very Good
Q31. Game goals (clear, logical, consistent).	.657	Very Good
Q34. Unpredictability of the game (artificial intelligence, events).	.652	Very Good
Q4. The experience with games of this company is better than I expected.	.651	Very Good
Q33. Game rules (clear, logical, fair).	.641	Very Good
Q32. Game rewards (for achieving game goals).	.635	Very Good
Q7. I recommend the games from this company to friends and family.	.624	Good
Q8. The games from this company are fun for players.	.623	Good
Q10. The games from this company allow me to play again and each time is different from the other.	.610	Good
Q21. Graphics	.608	Good
Q3. I intend to have other games from this company.	.595	Good
Q28. Character customization (clothes, accessories, avatar).	.588	Good
Q2. Most of the time that I play video games, I play the games from this company.	.587	Good
Q6. I prefer the games from this company.	.578	Good
Q27. Multiplayer mode.	.577	Good
Q19. Variety of game genres (strategy, RPG, platform, shooter).	.569	Good

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The results drove us to the conclusion that for large samples (greater than 300), both analyzes present similar results. So it's valid to assume that in some cases (e.g., large samples) Likert scales can be interval-level, in spite of OFA are always preferable than EFA (JAMIESON, 2004; KUZON Jr; URBANCHECK; McCABE, 1996). However, OFA appears to improve the quality and validity of the scale's items. This is probably because the scale format is Likert, an ordinal one, making OFA analysis more suitable but not invalidating the results got through EFA when the sample is large.

Scale's reliability was assessed trough Cronbach's alpha. Pasquali (2012) states that values above 0.70 indicate the scale is reliable, while values above 0.80 indicate that it is very reliable. According to Nunnaly and Bersntein (1994), significant alphas must be greater than 0.8 or even better 0.9. The value of Cronbach's alpha obtained for the CRM scale for Video Games was 0.94, considered very reliable according to the authors.

Nevertheless the analysis showed good psychometric indexes, it is necessary to verify the theoretical adequacy of the scale's items to the literature reviewed (KERLINGER; LEE, 2008). Eighteen items were derived from the interviews done and the others have a theoretical support indeed, as shown on Table 4.

Table 4 - Source of CRM Scale for Video Games' Items

Item Source	Quantity of Items	Item
Original CRM scale (Rozzett and Demo, 2010)	6	Q2-Q4, Q6, Q7, Q17
Players interviews	17	Q8, Q10, Q19-Q28, Q30-Q34
Theory about video games	1	Q29
Total	**24**	**24**

Griffin (2001) characterizes a customer's loyalty as frequent repeated purchases as well as the immunity to competitive pressure, (Questions 2, 3 and 6). Satisfaction is a relation between

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perception and expectation. When perception exceeds expectations, the customer is delighted and will be more prone to loyalty (Q4) (TSIROS; MITTAL; ROSS Jr, 2004; OLIVER, 2006). Reichheld and Sasser (1990) claim that customers make free advertisement of company's products and services to their friends and family while the relationship lasts. The longer the relationship, the more business customers will bring to the company (Q7). According to Nickels and Wood (1999), companies must offer improvements on product's features that are relevant to customers. In other words, customers must realize those improvements. Takeuchi and Quelch (1983) agree that companies should periodically conduct surveys to monitor customer satisfaction's perceptions about the quality of its products and services (Q17).

Schell (2011, p. 37) defines game as "a problem-solving activity, seen in a playful way." Therefore, the concept of game itself brings the idea of fun (Q8). Moreover, the author sets out the main elements of a video game, for example, mechanics, narrative and aesthetics. The mechanics refers to the internal mechanisms of the game, such as rules and procedures, and is responsible for creating the difference between games and other entertainment (e.g., movies, books, etc.). According to Schuytema (2008), Novak (2010) and Schell (2011), some elements of mechanics are: what actions the player can perform, diversity of games genres (Q19), goals (Q31), rewards (Q32), rules (Q33), interface (Q29), unpredictability of events in the game and sophistication of artificial intelligence used (Q34), difficulty (Q30), degree of interactivity or gameplay (Q26), game modes, such as multiplayer mode (Q27), customization or personalization (Q28), among others.

The narrative is the story, the inner meanings of the game and its theme (Q23) (Schell, 2011). The construction of the characters (Q25), dialogues and scenarios (Q24) help to build the mood of the game, which affects the player, providing the experience. In some games, the narrative is more elaborate than others, but all have this element, which comes down to the context of the game (SCHUYTEMA, 2008).

Finally, the aesthetics is everything the player sees and hears in the game, in other words, its sensations. Among the elements that

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constitute the game, is the one most directly related to the customers experience. The quality of songs and sounds (Q22) and the graphic quality of characters, environments, vehicles, videos or animations, colors, style of graphics (Q21), among others (SCHELL, 2011) are components of aesthetics.

Since we have a validated CRM scale for video games, we may evaluate the overall players' perceptions regarding aspects they consider relevant in their relationship with video games companies, specifically with Nintendo Wii, chosen because it is the current video game's industry leader. The results are seen on Table 5.

Table 5 - Perceptions Regarding Relationship (Overall)

Measured Aspect	Quantity of Items	Mean	Standart Deviation
Loyalty	7	3.27	1.03
Satisfaction	17	3.71	0.73
Relationship	24	3.58	0.76

The players surveyed presented moderately positive perceptions regarding aspects of loyalty to video games specifically Nintendo Wii the video game took as reference for the research. Nintendo really doesn't have a specific loyalty programs and strategies to its Brazilian consumers so it's an important aspect to be taken into consideration if the company wishes to keep its leader position in Brazil. The positive result was boosted by items such as fun provided by playing games, an aspect of loyalty resulted from elements of satisfaction.

Items regarding satisfaction were higher than average. Of the evaluated items, interactivity or gameplay and multiplayer mode stood out, which are the main concepts of Nintendo Wii and its games. The name of the console, Wii, is a reference to "we" (HOLLENSEN, 2010). The satisfaction item ranked worst was the one related to the quality graphics. Comparing to other modern consoles, Nintendo Wii presentes the most limited hardware. On the other hand, it's the cheapest one facilitating the entry of audiences in the gaming market. The degree of difficulty is also an item that showed a low degree of satisfaction. According to Hollensen (2010), Wii and its games are focused on family. This is reinforced by Nintendo's advertisements. So this low satisfaction with the level of difficulty can

be explained by the absence of a high degree of challenge, allowing all families' members to play. The item-by-item, or question-by--question's means and standard deviations can be seen on Table 6.

Table 6 - Perceptions Regarding Relationship (Question-by-Question)

Item	Mean	Standart Deviation
Q2. Most of the time that I play video games, I play the games from this company.	2.74	1.52
Q3. I intend to have other games from this company.	3.03	1.67
Q4. The experience with games of this company is better than I expected.	3.28	1.30
Q6. I prefer the games from this company.	2.52	1.50
Q7. I recommend the games from this company to friends and family.	3.63	1.37
Q8. The games from this company are fun.	4.38	0.96
Q10. The games from this company allow me to play again and each time is different from the other.	3.29	1.19
Q17. Overall quality.	3.73	1.02
Q19. Variety of game genres (strategy, RPG, platform, shooter).	3.55	1.13
Q20. Innovation or originality.	3.77	1.09
Q21. Graphics.	3.35	1.34
Q22. Sound and music.	3.87	1.12
Q23. Story.	3.63	1.06
Q24. Level design.	3.76	1.04
Q25. Characters (charismatic, well constructed, unforgettable).	3.89	1.08
Q26. Gameplay/interactivity.	4.09	1.02
Q27. Multiplayer mode.	3.95	1.07
Q28. Character customization (clothes, accessories, avatar).	3.63	1.06
Q29. Graphical User Interface (menu, life bar, minimap).	3.76	1.00
Q30. Challenge/difficulty.	3.59	1.04
Q31. Game goals (clear, logical, consistent).	3.80	0.92
Q32. Game rewards (for achieving game goals).	3.62	1.00
Q33. Game rules (clear, logical, fair).	3.74	0.95
Q34. Unpredictability of the game (artificial intelligence, events).	3.43	1.06

DOI: http://dx.doi.org/10.15603/1982-8756/roc.v11n22p285-312

Regarding the objective to assess the influence of some demographics (age, sex, and frequency of playing) on players' perceptions of their relationships with video games, Analysis of Variance (ANOVA) was performed. As set by Tabachnick and Fidell (2007, p.38), ANOVA "is a set of procedures which are based on comparing variances". Therefore, we first verified the homogeneity of the sample through Levene's test. Then, ANOVA was performed for items that showed homoscedasticity. The variable "gender" showed significant differences of perceptions on questions Q2, Q21, Q25, and Q27 as shown on Table 7.

Table 7 - Perceptions by Gender

Item	Gender	Mean	Standart Deviation
Q2	Female	3.17	1.50
	Male	2.78	1.47
Q21	Female	3.90	1.12
	Male	3.38	1.14
Q25	Female	3.85	0.90
	Male	4.20	0.92
Q27	Female	3.96	0.95
	Male	4.18	0.88

Nintendo succeeded in attracting new segments, such as women, for the gaming market and Q2 is an indicator that women prefer Wii better than men. Q21 indicates that women are more satisfied than men concerning Wii's graphical quality. According to Schell (2011), men and boys play more video games then women and so they are more demanding on certain elements of the game. The experience and contact with other platforms, like other consoles, can explain the difference in perception. The item about characters (Q25) indicated higher satisfaction of male audience. One reason may be that most of Wii games are sequences of old Nintendo consoles (e.g., NES and Super NES) that men are used to play. Characters as Mario, Luigi, and Donkey Kong were part of the childhood of many players. Finally, Wii and other consoles

stimulate competition in multiplayer mode. Schell (2011) states that men often prefer activities that encourage competition whereas women prefer cooperation. This may explain the greater mean of the male audience.

The variable "age" showed significant differences of perceptions on questions Q20, Q26, Q28, and Q32 as shown on Table 8.

Table 8 - Perceptions by Age

Item	Age	**Mean**	**Standart Deviation**
Q20	10-18 years	4.03	1.06
	19-24 years	3.73	0.99
	25 or more	3.65	1.11
Q26	10-18 years	4.33	0.93
	19-24 years	4.05	0.94
	25 or more	3.97	1.11
Q28	10-18 years	3.89	0.94
	19-24 years	3.74	0.99
	25 or more	3.47	1.10
Q32	10-18 years	3.86	0.95
	19-24 years	3.71	0.84
	25 or more	3.55	1.03

As people get older, their perception about the items evaluated suffers a negative impact. In general, the greater the age, the more references a person has. Thus, they tend to compare many different games being more demanding, trait that may influence the perception of originality (Q20). Although the interactivity (Q26) of Wii has been considered innovative (HOLLENSEN, 2010), many of its elements existed in the 90s. The innovation of Nintendo Wii's interactivity is actually due to the ability to assemble different accessories in a single control. Then, older players don't think Wii is that interactive comparing to other games they have experienced in the past. Moreover, with increasing age, less free time. According to Schell (2011), players between 25 and 34 year-old have little time available for leisure activities and tend to be more selective

regarding customization (Q28). Also, most players over 35 years are involved with career and family, becoming casual players only. The scarcity of time makes them players choosy about their hobbies and how they are rewarded when playing video games (Q32).

The variable "frequency of playing" showed significant differences of perceptions on questions Q3, Q25, and Q29 as shown on Table 9.

Table 9 - Perceptions by Frequency of Playing

Item	Frequency of Play (daily)	Mean	Standart Deviation
Q3	Rarely	2.44	1.51
	Less than 1 hour	3.46	1.47
	More than 1 hour	3.57	1.67
Q25	Rarely	3.71	0.93
	Less than 1 hour	4.02	0.94
	More than 1 hour	4.27	1.08
Q29	Rarely	3.68	0.83
	Less than 1 hour	3.82	0.90
	More than 1 hour	4.07	0.95

Players who play often presented greater mean, which seems obvious, the more a person like an activity, the more he practices it and the more he wants to buy other similar games (Q3). Also, the more one acquires knowledge and experience in a specific game, the more critical and demanding he becomes regarding characters (Q25), for instance, and other games' elements. Then the high satisfaction of the players frequently can be associated to the high quality of Wii games and the experiences offered by them. Casual players, or one who rarely plays, need a friendly interface, simple to understand and use. Schell (2011) states that the interface, or facility to play and understand the game, is like a bridge that connects the player to the experience of gaming. The result of Q29 may indicate that casual players have more difficulty to control the interface of Wii games, as players frequently have a greater ease in mastering it. Thereby, casual players are supposed to have a lower level of demand, getting more satisfied than more experienced and frequent players.

Academic And Managerial Implications

Considering the video games' industry competitiveness and the current companie's need to invest on long term relationships with customers to get their loyalty, the main objective of this research was to develop and validate a CRM scale for video games in order to assess players' perceptions regarding aspects they consider relevant in their relationship with video games. Customer's loyalty is crucial in a highly competitive industry, as the video games one, where there are thousands of releases each year and the lifetime cycle of products is short. The scale was developed from the scientific theory of CRM and Video Games, as well as interviews with players in search of the most important elements that constitute a game. The final version of the instrument was composed by 24 items, of which, 7 are proposed to measure the perception of players concerning loyalty, and 17 measure their satisfaction with specific elements of video games. The scale total variance explained was about 44%. It showed validity of items (all of them was rated as excelent, very good and good) and also high reliability (Cronbach's alpha = 0.94). The Exploratory and Ordinal Factor analyzes drove us to the conclusion that for large samples (greater than 300) there are no significant differences in the results of scales' validation even when researchers use ordinal scales (e.g., Likert cales). However, it's important to highlight that when using ordinal scales OFA is always preferable, according to the authors (HOLGADO–TELLO et al., 2010; JAMIESON, 2004; KUZON Jr; URBANCHECK; McCABE, 1996).

As to the academic implications, we provide empirical evidence on the testable scales that are both reliable and valid. This gives a new theoretical insight into how CRM aspects regarding loyalty and satisfaction can be managed to establish profitable long-term relationships with strategic customers. Also, the CRM scale for video games showed meritorious psychometric indexes making it suitable to be used in relational studies in the Marketing, Consumer Behavior and Management fields. Moreover, it contributes to the deepening of studies on CRM measures, still scarce on the marketing literature.

Concerning managerial implications, our scale might be used as an instrument of evaluation to help managers of video games in general better understand how to meet client's needs in order to de-

DOI: http://dx.doi.org/10.15603/1982-8756/roc.v11n22p285-312

liver high-value products and services and get their loyalty through a long-term and profitable relationship. We've chosen Nintendo Wii video game because it is the current world's market leader in the video game's industry, so it's a good representative of this kind of product. Nonetheless, since video games' elements are pretty similar, our results can be extended to other video games industries.

The players surveyed perceive their relationship with Nintendo Wii as moderately positive. However, the perception regarding loyalty's aspects was lower than satisfaction's ones, supporting the idea that satisfaction does not necessarily lead to loyalty (REICHHELD; SASSER, 1990; BOLTON, 1998), which means that there is much room for Nintendo to invest on long-term relationships strategies with its customers. As a matter of fact, companies in general should think carefully about how to get customers' loyalty, especially in a high-competitive market. Furthermore, age, gender and frequency of playing seem to have little influence on players' perceptions regarding CRM aspects.

Beyond, there is theoretical and empirical evidence that CRM is a critical success factor for business performance (RYALS; KNOX, 2001; RYALS; PAYNE, 2001; SHETH; SISODIA, 2001; SHETH; SISODIA, 2002; SIN, TSE; YIM, 2005; HUANG; XIONG, 2010, ERNST et al., 2011). Consequently, the CRM Scale for Video Games may support managers' decision-making and problem-solving regarding identification of CRM areas where specific improvements are needed in order to achieve better organizational outcomes.

Limitations And Directions For Future Research

Our proposal represents a first attempt to develop and test a CRM scale designed specifically to the video game's market so far. Then, a first limitation is that the present findings are therefore indicative rather than conclusive. It would be useful to further assess the generalizability of the scale to other business environments such as American, European and Asian countries. Besides, a confirmatory factor analysis using structural equation modeling must be run to confirm the structure obtained trough EFA. With more replicative and creative research, a more comprehensive conceptual framework related to CRM can be developed in the future.

Another limitation is the cross-sectional nature of the data. The development of a time-series database and testing of the CRM structure validated here in a longitudinal framework would provide a refinement of the scale. Continued validations of the CRMS is recommended based on further research about new CRM and Video Games trends and perspectives, especially because Nintendo has recently released Nintendo Wii U, and also contemplating changes in business environments.

Since we didn't find empirical researches comparing EFA and OFA so far, it is also recommended to conduct further studies comparing both methods to confirm or not the theory reviewed (HOLGADO–TELL et al., 2010; JAMIESON, 2004; KUZON Jr; URBANCHECK; McCABE, 1996). This would be especially recommended for small samples (e.g., less than 300), to check out if there are significant differences indeed and EFA is not appropriate, as set by authors like Jöreskog and Moustaki (2001) and Armstrong (1981). In this case, if the results turn out to be significant different, we maybe conclude that EFA is not appropriate for ordinal scales when small samples are used.

Furthermore, it would be contributive for studies to assess the company's perspective on the relationship with customers as well to see if there are companies' efforts indeed in getting customers loyalty by developing a profitable long-term relationship with them. The results would be more comprehensive if there was a comparison between the company and the players' perspectives. As an example we may cite the scale developed by Sin, Tse and Yim (2005), which evaluates whether the company is prepared to implement the CRM and benefit from it.

Conclusion

We may conclude, in spite of the limitations pointed, that the main objective of this study was reached and a scale to assess what aspects video game players rank as relevant regarding CRM was produced showing theoretical consistency, reliability, construct validity. Considering the increasing research attention to the new strategic role of CRM in organizations and the high competitiveness of the video game industry, this study provides an operatio-

DOI: http://dx.doi.org/10.15603/1982-8756/roc.v11n22p285-312

nal measure of it. The findings found here are not intended to be conclusive or limiting but offer a useful starting point from which further theoretical and empirical research of CRM strategies for the video games industry can be built.

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Recebido em: 8.1.2015
Aprovado em: 29.10.2015
Avaliado pelo sistema double blind review.
Editor: Elmo Tambosi Filho.
Disponível em http://mjs.metodista.br/index.php/roc